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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/688,901	10/21/2003	Derrick Kevin To	C525 0339 GNM/cc	3766
720	7590	08/23/2005	EXAMINER	
OYEN, WIGGS, GREEN & MUTALA LLP 480 - THE STATION 601 WEST CORDOVA STREET VANCOUVER, BC V6B 1G1 CANADA			PHAM, HAI CHI	
			ART UNIT	PAPER NUMBER
			2861	

DATE MAILED: 08/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/688,901

Applicant(s)

TO ET AL.

Examiner

Hai C. Pham

Art Unit

2861

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) 22-32 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1, 3-21 and 33-35 is/are rejected.
- 7) ☒ Claim(s) 2 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 06/01/04.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: ____.

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-21 and 33-35, drawn to the adjustment of the positions of the printheads mounted on a lead screw based on the location of the imaging beam, classified in class 347, subclass 234.
 - II. Claims 22-32, drawn to the adjustment of the traverse speed of one of the plural print head based on the detected degree of misalignment between the print heads, classified in class 347, subclass 116.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP § 806.04, MPEP § 808.01). In the instant case, the invention I is dedicated to adjust the spacing between the at least two print heads in accordance with the number of recording sheets and the size of the media, such adjustment being based on the determination of the pointing location of the imaging beam, while the invention II is tailored to adjust the traverse speed of at least one of the print heads in accordance with the determined degree of misalignment wherein the misalignment determination is based on the examination of the degree of offset or overlap between printed test images.

3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

4. Because these inventions are distinct for the reasons given above and the search required for Invention I is not required for Invention II, restriction for examination purposes as indicated is proper.

5. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

6. During a telephone conversation with Attorney Gavin N. Manning on August 12, 2005 a provisional election was made without traverse to prosecute the invention I, including claims 1-21 and 33-35. Affirmation of this election must be made by applicant in replying to this Office action. Claims 22-32 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

7. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Objections

8. Claim 4 is objected to because of the following informalities:

- Lines 4-5, "the associated exposure head capable of being displaced relative to the exposure head" should read --the associated exposure head capable of being displaced relative to the other exposure head--, for more clarity.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

10. Claims 1, 3, 16 and 20-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Gamblin (U.S. 4,131,898).

Gamblin teaches an interlacing recorder comprising a media carrier (drum 13) carrying the recording sheet (paper 12), at least two exposure heads spaced apart from

one another (print heads 10 and 11 are spaced apart by a distance S) (Fig. 3), each exposure head disposed to image a portion of a single sheet of media (sheet of paper 12) secured on the media carrier, an adjustable mechanism for moving the exposure heads relative to each other to change a spacing therebetween (the distance between the print heads is adjusted such that the full width printed bands interlace at their edges) (see Abstract).

Gamblin further teaches joining the portion imaged by each exposure head to form a unitary image on the single sheet of media secured on the media carrier (the printed dots 24 formed by the print head 10 and the printed dots 25 formed by the print head 11 are joined to form a unitary image) (Figs. 4-5), wherein the joining comprises at least partially overlapping the portions imaged by each exposure head (Figs. 4-5).

The method claim 16 is deemed to be clearly anticipated by functions of the above structures.

11. Claims 1, 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Hipp et al. (U.S. 6,290,326).

Hipp et al. discloses an image recording apparatus including a media carrier (rollers 15 and 16), at least two exposure heads (print heads 11) spaced apart from one another (Fig. 1), each exposure head disposed to image a portion of a single sheet of media (recording medium 13), an adjustable mechanism (not shown) for moving the exposure heads relative to each other to change a spacing therebetween (the positions of the print heads 11 are adjustable along the traverse direction 21) (col. 5, lines 4-9).

The method claim 16 is deemed to be clearly anticipated by functions of the above structures.

12. Claims 1, 3, 8, 15-16 are rejected under 35 U.S.C. 102(e) as being anticipated by Okamoto et al. (Pub. No. U.S. 2003/0048467).

Okamoto et al., an acknowledged prior art, discloses an image recording apparatus comprising two recording heads (2 and 3) each being mounted on a separate lead screw (e.g., ball screws 13) and controlled to be positioned at a predetermined locations relative to each other and with respect to the printing plate based on the divisional image data such that the recording heads perform scanning concurrently their respective areas, the printing plate being supported by a cylindrical drum (1).

13. Claims 33-35 are rejected under 35 U.S.C. 102(b) as being anticipated by Nakao et al. (U.S. 5,359,434).

Nakao et al. discloses an image forming apparatus comprising a target (mark 12) for determining the position of a laser beam, the target having a pair of lines on a background, the lines at a pre-determined angle to each other, the lines of contrasting reflectivity to the background (e.g., in Fig. 11A, the mark 12 having at least a line mark 12a and line marks 12b disposed at right angles, the mark being formed on the surface of the photoconductor 1 at a non-imaging region 1b and being formed of a material having a reflectance different from that of the photoconductor) (col. 10, lines 28-45).

Nakao et al. further teaches:

- a light sensor (photo detective element 13 having a light-receiving unit 7) to sense the intensity of the reflected laser beam from the target (col. 14, lines 38-41),
- the intensity of a reflected laser beam from the pair of lines is indicative of both the X and Y co-ordinates of the laser beam (the position of the laser beam in both main and sub-scanning directions are corrected based on the detection of the mark) (col. 8, lines 4-31).

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15. Claims 3-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hipp et al. in view of Gamblin.

With regard to claim 3, Hipp et al. discloses all the basic limitations of the claimed invention except for the media carrier being a cylindrical drum.

However, it is old and well known in the art to use either a pair of rollers, e.g., rollers 15 and 16 in Hipp et al., or a cylindrical drum (13) as taught by Gamblin.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide a cylindrical drum as an image carrier in the device of Hipp et al. as taught by Gamblin since Gamblin teaches this to be known in

the art to use a drum for supporting the recording medium, the incorporation of such drum would require only routine skill in the art.

Hipp et al. further teaches each exposure head being traversed by a lead screw nut (traveling nuts 22) coupled to the exposure head and located on a common lead screw (20) and the adjustable mechanism (not shown) comprising a coupling between at least one of the lead screw nuts and the associated exposure head capable of being displaced relative to the other exposure head, the lead screw nut being rotated on the common lead screw (it is noted that the traveling nut is inherently connected to a drive system, which rotates the lead screw nut for providing a movement of the exposure head along the lead screw), an auxiliary motor for rotating the lead screw nut nuts in response to signals provided by a controller (firing control 19), each of the lead screw nuts being rotatable and the common lead screw being held fixed (as explained above, the movement of the exposure head being performed by the driven lead screw nut).

16. Claims 9-14, 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okamoto et al. in view of Nakao et al.

Okamoto et al. discloses all the basic limitations of the claimed invention except for the target providing information of the location of the imaging beam along with the position sensitive detector, the target being formed with a pair of lines, being located and held fixed on the media carrier, and being a single common target.

Nakao et al. discloses an image forming apparatus comprising a target (mark 12) for determining the position of a laser beam, the target having a pair of lines on a

background, the lines at a pre-determined angle to each other, the lines of contrasting reflectivity to the background (e.g., in Fig. 11A, the mark 12 having at least a line mark 12a and line marks 12b disposed at right angles, the mark being formed on the surface of the photoconductor 1 at a non-imaging region 1b and being formed of a material having a reflectance different from that of the photoconductor) (col. 10, lines 28-45). Nakao et al. further teaches the target (mark 12) being located and fixed on the photoreceptor, and being provided as a single common target for determining the location of the plurality of laser beams (Fig. 18).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide the target for detecting the position of the beam in the device of Okamoto et al. as taught by Nakao et al. The motivation for doing so would have been to allow for optimal scanning of the exposure head.

17. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hipp et al. in view of Karz (U.S. 5,587,730).

Hipp et al. discloses all the basic limitations of the claimed invention except for in the event of failure of one of the exposure head, the imaging is completed by the other exposure head.

Karz discloses a redundant printing head for replacing the faulty printing head for improved reliability.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide the redundant printing head in the device of

Hipp et al. as taught by Karz. The motivation for doing so would have been to allow the completion of the image forming operation with interruption and to improve reliability as suggested by Karz.

Allowable Subject Matter

18. Claim 2 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

19. The following is a statement of reasons for the indication of allowable subject matter: the primary reason for the indication of the allowability of claim 2 is the inclusion therein, in combination as currently claimed, of the limitation “wherein the adjustable mechanism comprises a heater located to controllably heat a rigid spacer coupling the exposure heads”, which is not found taught by the prior art of record considered alone or in combination.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hai C. Pham whose telephone number is (571) 272-2260. The examiner can normally be reached on M-F 8:30AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner’s supervisor, David L. Talbott can be reached on (571) 272-1934. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



HAI PHAM
PRIMARY EXAMINER

August 21, 2005